

Notes on black elytron species of *Pyrrhalta* Joannis and the description of a new species from China (Coleoptera, Chrysomelidae, Galerucinae)

Rui-E Nie^{1,†}, Da-Kang Zhou^{1,2,‡}, Huai-Jun Xue^{1,§}, Xing-Ke Yang^{1,|}

1 Key Laboratory of Zoological Systematics and Evolution, Institute of Zoology, Chinese Academy of Sciences, Beijing, 100101, China **2** Beijing Botanical Garden, Beijing, 100093, China

[†] urn:lsid:zoobank.org:author:AD7847BD-8394-4EBA-AB07-A947661C0894

[‡] urn:lsid:zoobank.org:author:6130E443-86C4-4DFA-8721-7E8D7AECDB11

[§] urn:lsid:zoobank.org:author:3401AC1C-253B-4D40-A399-02274728F5F8

[|] urn:lsid:zoobank.org:author:1DFA8B54-148D-4346-82B1-35DDBBFA9644

Corresponding author: Xing-Ke Yang (yangxk@ioz.ac.cn)

Academic editor: A. Konstantinov | Received 8 November 2012 | Accepted 26 March 2013 | Published 12 April 2013

urn:lsid:zoobank.org:pub:D4DDE242-C25A-4A1D-9E50-8CC044B8E108

Citation: Nie R-E, Zhou D-K, Xue H-J, Yang X-K (2013) Notes on black elytron species of *Pyrrhalta* Joannis and the description of a new species from China (Coleoptera, Chrysomelidae, Galerucinae). ZooKeys 289: 41–56. doi: 10.3897/zookeys.289.4266

Abstract

Thirteen species of *Pyrrhalta* Joannis, 1865 with black elytron are reviewed. A key to species, photographs of aedeagus and habitus are provided. *Pyrrhalta qianana* **sp. n.** is described from Guizhou, China. *Pyrrhalta martensi* Medvedev *et* Sprecher-Uebersax, 1999 is newly recorded from China (Tibet).

Keywords

Coleoptera, Galerucinae, *Pyrrhalta*, black elytron, new species, key

Introduction

The genus *Pyrrhalta* Joannis, 1865 is a large, worldwide genus distributed in the Holarctic, Oriental and Australian Regions. The genus was firstly proposed as a subgenus of *Galeruca* Geoffroy, 1762 by Joannis (1865), and *Galeruca viburni* Paykull, 1799 was deemed to be fixed as type species by monotypy. The genus presents serious difficulties in several aspects of its classification and nomenclature. Firstly, this genus is very large

including 115 species in the world (Xue and Yang 2010). Secondly, its status is still not entirely clear being obscured by apparent relationship of *Pyrrhalta* and *Galerucella* Crotch, 1873 (Weise 1924, Gressitt and Kimoto 1963, Wilcox 1965). Separation of species of typical *Pyrrhalta* and *Galerucella* was based on a character of the pronotum. The whole pronotum of *Pyrrhalta* is covered by hairs, while at least the middle region of the pronotum of *Galerucella* is glabrous (Gressitt and Kimoto 1963). However, a use of this character was not consistent in the past by different specialists. Some species whose pronotum covered with hair were treated as *Galerucella*, while some species having glabrous area of pronotum were placed in *Pyrrhalta*. Meanwhile, some tentative *Galerucella* species were included into *Pyrrhalta* clade based on molecular data (Nie et al. 2012). Whether the pronotum character can be regarded as the unique character to distinguish the two genera need be further studied, and the morphological characters for distinguishing *Galerucella* and *Pyrrhalta* need to be addressed in the future. Thirdly, the subgenera of *Pyrrhalta* are still not well defined. For example, *Clitenosia* Laboissière, 1931, *Xanthogaleruca* Laboissière, 1934 and *Tricholochmaea* Laboissière, 1932 were considered as synonyms of *Pyrrhalta* (Gressitt and Kimoto 1963), while in another study, the groups *Galerucella*, *Neogalerucella* Chûjô, 1962, *Xanthogaleruca* and *Tricholochmaea* were treated as subgenera of *Pyrrhalta* (Wilcox 1965). *Galerucella*, *Xanthogaleruca*, and *Tricholochmaea* were treated as valid genera and *Neogalerucella* as subgenus of *Galerucella* in some recent studies (Silfverberg 1974, Beenen 2008, Gök et al. 2007, Beenen 2010). The most important argument is whether *Xanthogaleruca* is treated as a valid genus or a subgenus of *Pyrrhalta*. The character that defines *Xanthogaleruca* as a genus is the aedeagus with a comb-shaped internal sac (Silfverberg 1974, Beenen 2003, Gök et al. 2007). However, the relative value of this character is not proved yet. In present study, *Xanthogaleruca* is treated as a synonym of *Pyrrhalta* until evidence suggesting otherwise are presented.

This study focuses on the *Pyrrhalta* species with black elytra, which may not be a natural group. We defined the main character state of the group as “elytra entirely or at least 2/3 black”. There are 13 species included in this group. Among them, *P. qianana* sp. n., a new species described below. A key to the species of the group is provided.

Material and methods

Morphological characters were examined with an Olympus SZ 61 microscope. Genitalia of males and / or females of each species were dissected using the following procedure: for dried or ethanol preserved specimens, the abdomen was separated, transferred to a vial containing 10% KOH which was heated in a boiling water bath for 10 min. The genitalia were then carefully removed in a cavity slide under distilled water using fine forceps and hooked minuten-pin dissecting needles. Series of partially focused photographs were made with a digital camera (Nikon D300S) attached to a stereomicroscope (Zeiss Discovery V12), and then combined using Helicon Focus software, and finally were evaluated and assembled using Adobe Photoshop CS 8.0 and Illustrator CS4 software.

Material examined is deposited in the following collections

BMNH	The Natural History Museum, London, UK
IZAS	Institute of Zoology, Chinese Academy of Sciences, Beijing, China
JBCB	Jan Bezděk collection, Brno, Czech Republic
MHBU	Museum of Hebei University, Baoding, Hebei, China
NHMB	Naturhistorisches Museum Basel, Switzerland
USNM	The United States National Museum of Natural History (Smithsonian Institution), Washington, D.C., USA
ZIN	Zoological Institute, Russian Academy of Sciences, Saint-Petersburg, Russia

Taxonomy**Key to species of *Pyrrhalta* with entirely or at least 2/3 black elytra**

- 1 Head and pronotum yellowish brown, with or without black markings **2**
- Head and pronotum dark, with or without brown markings..... **10**
- 2 Occiput without black spots **3**
- Occiput with black spots **4**
- 3 Elytron entirely black with flattish surface, space between punctures smaller than diameter of puncture ***P. huangshana* Chen, 1964**
- Elytron black, suture and lateral margins light yellow; elytral surface convex, space between punctures larger than diameter of puncture ... ***P. qianana* sp. n.**
- 4 Middle of pronotum with black reversed trapezoid marking ***P. meghalayana* Medvedev, 2002**
- Pronotum with three black spots, located in both lateral sides and middle of disc **5**
- 5 Elytron black, a short yellowish brown longitudinal stripe present at base of elytron, which less than 1/4 of elytral length..... ***P. martensi* Medvedev et Sprecher, 1999**
- Elytron black, without yellowish brown stripe or with a long yellowish brown longitudinal stripe through the whole elytron **6**
- 6 Elytron surface with ridges..... **7**
- Elytron surface without ridges **8**
- 7 Elytron dark metallic bronze with slight shade of olive green; with two distinct longitudinal ridges close to suture and flat margin ***P. subaenea* (Ogloblin, 1936)**
- Elytron black, lateral margin and epipleuron brown, disc with 7 irregular black spots formed by groups of dense punctures, short yellowish band present at base of elytron which is the same length as scutellum; longitudinal ridge in middle of disc and under humerus..... ***P. tianmuensis* Chen, 1964**

- 8 Elytron black, each with yellow longitudinal stripe starting side of humerus and ending before elytral apex, elytral margin and epipleuron brown ***P. warchalowskii* Bezděk, 2007**
- Elytron black or reddish brown or brown black, without yellow longitudinal stripe, elytral margin and epipleuron brown or black **9**
- 9 Antenna 1/3 as long as elytra; basal margin of pronotum slightly concave in middle, lateral margin clearly convex in 1/2; elytron entirely black, disc convex with dense, deep punctures ***P. orientalis* (Ogloblin, 1936)**
- Antenna 1/2 as long as elytra; basal margin of pronotum sinuate, lateral margin narrow basally, obtusely rounded anteriorly; elytron black, basally, along suture, with stripe in middle of disc, lateral margin and epipleuron brown, disc with dense, small, and shallow punctures ***P. sulcatipennis* (Chen, 1942)**
- 10 Occiput with two brown spots; pronotal disc with six small depressions ***P. fossata* (Chen, 1942)**
- Occiput without two brown spots; pronotal disc with three depressions ... **11**
- 11 Elytron reddish brown with broad longitudinal blackish marking covering nearly all interior 2/3 of disc ***P. tatesuji* Kimoto, 2001**
- Elytron without blackish marking **12**
- 12 Antenna slender; pronotum with V shaped depressions besides of disc, a triangle concave near middle of basal margin; elytron bronzy black with purplish or bronzy tinges metallic lustre, lateral margin not with expanded margin ***P. metallica* Gressitt et Kimoto, 1963**
- Antenna very stout; pronotum with a wide longitudinal depression in the middle of disc, round depressions besides of disc; elytron brown black, different shades, with bronze metallic lustre, lateral margin expanded with a swollen ridge parallel to margin ***P. xizangana* Chen et Jiang, 1981**

1. *Pyrrhalta fossata* (Chen, 1942)

http://species-id.net/wiki/Pyrrhalta_fossata

Figs 1–2, 42

Galerucella fossata Chen, 1942: 19.

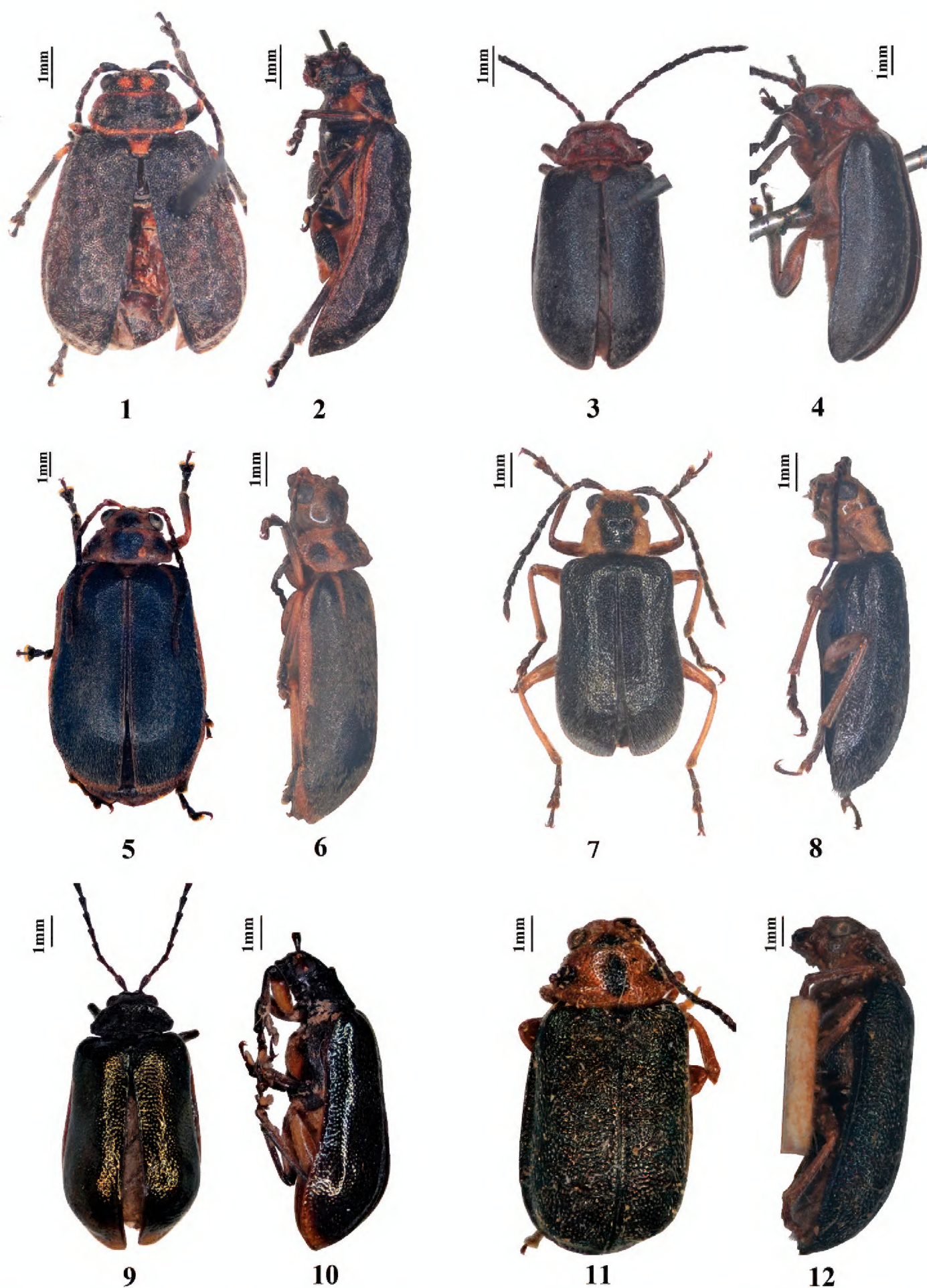
Pyrrhalta fossata: Gressitt & Kimoto, 1963: 439, 449.

Neogalerucella fossata: Beenen, 2010: 449.

Specimens examined. Type material: Holotype: ♀, re-written (original label is in Chinese): China, Sichuan, Kangding, 25-VIII-1939, collector unknown (IZAS).

Distribution. China (Sichuan).

Notes. Holotype of this species was diagnosed as male in the original description without being dissected (Chen 1942). Actually the holotype is female. Its spermatheca is illustrated here (Fig. 42). The updated catalogue of Galerucinae (Beenen 2010)



Figures 1–12. Habitus. 1–2 *P. fossata* (holotype) 3–4 *P. huangshana* (holotype) 5–6 *P. martensi* (paratype) 7–8 *P. meghalayana* (paratype) 9–10 *P. metallica* 11–12 *P. orientalis* (holotype).

showed that this species belonged to a subgenus *Neogalerucella* of *Galerucella*. In this study, we found that the disc of pronotum is entirely covered by hairs. So we think that this species should be remained in *Pyrrhalta*.

2. *Pyrrhalta huangshana* Chen, 1964

http://species-id.net/wiki/Pyrrhalta_huangshana

Figs 3–4, 24–25

Pyrrhalta huangshana Chen, 1964: 207.

Specimens examined. Type material: Holotype: ♂, re-written (original label is in Chinese): China, Anhui, Huang Mountain, 5-VIII-1936, collector unknown (IZAS).

Distribution. China (Anhui).

Notes. Aedeagus of the holotype is illustrated here (Figs 24–25), dorsal view: asymmetrical but nearly parallel-sided, tapered at extreme apex which is subacute; dorsal opening largely on the left side; lateral view: gradually tapering to a subacute tip, slightly arched on the left side, nearly semi - circular on right side.

3. *Pyrrhalta martensi* Medvedev et Sprecher, 1999

http://species-id.net/wiki/Pyrrhalta_martensi

Figs 5–6, 26–27

Pyrrhalta martensi Medvedev & Sprecher, 1999: 366.

Specimens examined. Type material: Paratypes: 1 ♀, original label: “W-Nepal, Kali Gandaki, Knola C.J. Rai / Kopchepani, 1500–1600 m, 21-V-1984 / PARATYPUS, L.N. Medvedev” (NHMB); 1 ♂, original label: “India, Darjeeling D., Bhakta B. / Kalimpong, 9th mile 1500 m, 14.VII84 / PARATYPUS, L.N. Medvedev” (NHMB).

Other material (2 spec.): 2 ♂, China, Tibet, Linzhi, Muotuo, Yarang, 760m, 19-VIII-2006, Ming Bai leg. (IZAS).

Distribution. China (Tibet), India, and Nepal.

Notes. This is the first record of this species in China.

4. *Pyrrhalta meghalayana* Medvedev, 2002

http://species-id.net/wiki/Pyrrhalta_meghalayana

Figs 7–8, 28–29

Pyrrhalta meghalayana Medvedev, 2002: 247.

Specimens examined. Type material: Paratypes: 1 ♂, 1 ♀, original label: “NE INDIA; Meghalayana; 1999, 3Km E Tura; 1150; 25°30'N, 90°14'E; 18. IV.; Dembický & Pacholátka leg. / PARATYPE” (NHMB).

Other material (1 spec.): 1 ♀, NE India, Meghalaya, SW of Sohra, 25°13–14'N, 91°40', 700–950m, 22-V-2005, C.L. Peša leg. (JBCB).

Distribution. India.

5. *Pyrrhalta metallica* Gressitt & Kimoto, 1963

http://species-id.net/wiki/Pyrrhalta_metallica

Figs 9–10, 30–31

Pyrrhalta metallica Gressitt & Kimoto, 1963: 457.

Specimens examined. Type material: Allotype: 1 ♀, original label: “near O-Er., Nr Weichow, Aug. 6 18 '33, 6000–1500 ft / Szechwan China, DC Graham / ALLOTYPE J.L. Gressitt” (USNMNH).

Other material (3 spec.): 2 ♂, China, Yunnan, Yundi, 3700m, 28-VII-1979, Jiang-Xing Rao leg. (IZAS); 1 ♂, China, Yunnan, Yundi, 3700m, 28-VII-1979, Zhi-Wen Kui leg. (IZAS).

Distribution. China (Sichuan, Yunnan).

6. *Pyrrhalta orientalis* (Ogloblin, 1936)

http://species-id.net/wiki/Pyrrhalta_orientalis

Figs 11–12, 32–33

Galerucella (Xanthogaleruca) orientalis Ogloblin, 1936: 102, 390.

Pyrrhalta orientalis: Gressitt & Kimoto, 1963: 461.

Specimens examined. Type material: Type: ♂, original label: “Shan-hai-Kwan, In Mountains, 1.9.06., F.M. Thomson, 1907-200 / *Galerucella orientalis* sp. n., D. Ogloblin det., 1935. type.” (BMNH).

Other material (44 spec.): 1 ♂, China, Beijing, Badaling, 700m, 23-VII-1964, Qin Zhou (IZAS); 1 ♀, China, Beijing, Badaling, 27-V-1980, collector unknown (IZAS); 2 ♀, China, Beijing, Shanbao, 26-V-1978, Sheng-Qiao Jiang leg. (IZAS); 1 ♂, China, Beijing, Shanbao, 4-VII-1978, Sheng-Qiao Jiang leg. (IZAS); 1 ♂, China, Beijing, Shanbao, 09-VII-1964, Su-Bo Liao leg. (IZAS); 19 ♀, 19 ♂, China, Shandong, Tai Mountain, 21-IV-1993, Cheng-Gang Zhou leg. (IZAS)

Distribution. China (Liaoning, Hebei, Shanxi, Shandong, Fujian).

Notes. Aedeagus is illustrated here (Figs 32–33), dorsal view: slightly asymmetrical, gradually and slightly widened to apex, apex with a long acute tip; lateral view: nearly straight on left side, gradually tapering to acute tip on right side.

7. *Pyrrhalta subaenea* (Ogloblin, 1936)

http://species-id.net/wiki/Pyrrhalta_subaenea

Figs 13–14, 34–35

Galerucella (*Xanthogaleruca*) *subaenea* Ogloblin, 1936: 102, 389.

Pyrrhalta subaenea: Gressitt & Kimoto, 1963: 466.

Specimens examined. Type material: Syntypes: 1♀, 1♂, original label: “entre Za-mi et Ta-pa, 16-VII-93, Tchouen tshin / Syntypus” (ZIN).

Distribution. China (Sichuan).

Notes. Aedeagus of a syntype is illustrated here (Figs 34–35), dorsal view: slightly asymmetrical, gradually and slightly widened to apex, apex with acute tip in middle; lateral view: gradually tapering to subacute tip, slightly arched on left side, nearly semi-ellipse on right side.

8. *Pyrrhalta sulcatipennis* (Chen, 1942)

http://species-id.net/wiki/Pyrrhalta_sulcatipennis

Figs 15–16, 36–37

Gallerucella sulcatipennis Chen, 1942: 18.

Pyrrhalta sulcatipennis: Gressitt & Kimoto, 1963: 466.

Specimens examined. Type material: Holotype: ♂, re-written (original labels are in Chinese): China, Sichuan, Emei Mountain, 25-VIII-1939, C.S. TSI leg. (IZAS); Paratype: 1♀, 1♂, the same locality as Holotype (IZAS).

Other material (26 spec.): 1♀, China, Hunan, Sangzhi, Tianping Mountain, 1400m, 12-VIII-1988, Shu-Yong Wang leg. (MHBU); 5♀, 5♂, China, Hunan, Sangzhi, Bada Mountain, 10/11-VII-2004, Ji-Liang Wang and Jian-Feng Wang leg. (MHBU); 4♂, China, Sichuan, Emei Mountain, 25-VIII-1939, You-Cai Lu and Zong-Yuan Wang leg. (IZAS); 2♀, China, Guizhou, Fanjing Mountain, 2300m, 5/4-VIII-2001, Hong-Bin Liang leg. (IZAS); 6♀, China, Guizhou, Fanjing Mountain, 800–1600m, 5-VIII-2001, Kang-Zhen Dong leg. (IZAS); 3♂, China, Guizhou, Zunyi, Kuankuoshui Nature Reserve, 1530m, 7-VI-2010, Rui-E Nie leg. (IZAS).

Distribution. China (Hunan, Sichuan, Guizhou).

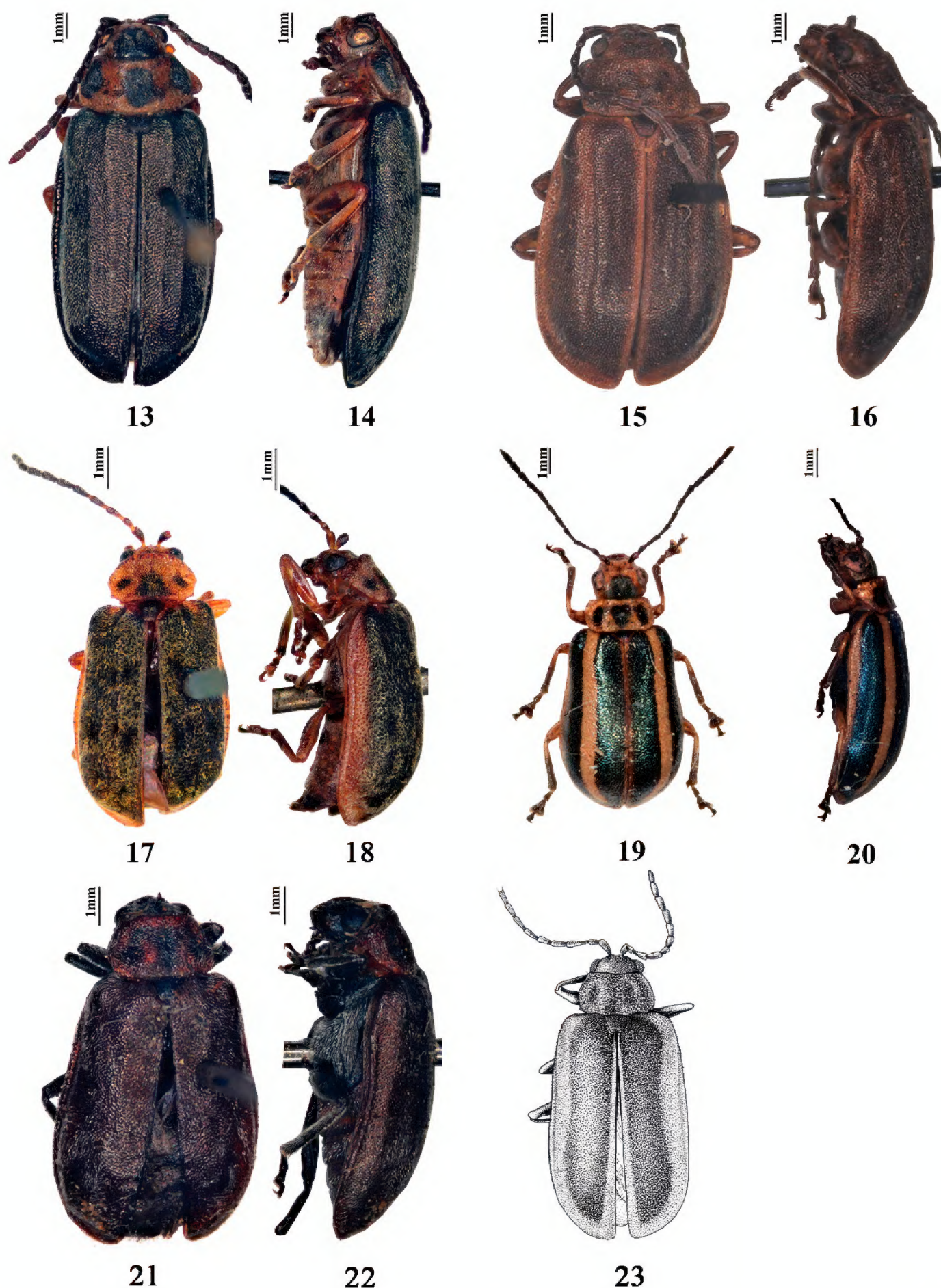
9. *Pyrrhalta tatesuji* Kimoto, 2001

http://species-id.net/wiki/Pyrrhalta_tatesuji

Fig. 23

Pyrrhalta tatesuji Kimoto, 2001: 45.

Distribution. Nepal.



Figures 13–23. Habitus. **13–14** *P. subaenea* (syntype) **15–16** *P. sulcatipennis* (holotype) **17–18** *P. tianmuensis* (holotype) **19–20** *P. warchalowskii* (paratype) **21–22** *P. xizangana* (holotype) **23** *P. tatesuji* Kimoto (drawing after original photograph in Kimoto, 2001).

Notes. We did not examine any specimens of this species. We diagnosed it as belonging to elytron-black group based on the original description and the figure of type (Fig. 23).

10. *Pyrrhalta tianmuensis* Chen, 1964

http://species-id.net/wiki/Pyrrhalta_tianmuensis

Figs 17–18, 38–39

Pyrrhalta tianmuensis Chen, 1964: 207.

Specimens examined. Type material: Holotype: ♀, re-written (original labels are in Chinese): China, Zhejiang, Tianmu Mountain, 6-VIII-1937, collector unknown (IZAS).

Other material (1 spec.): 1 ♂, China, Zhejiang, W. Tianmu Mountain, 30-VII-1998, Hong Wu leg. (IZAS).

Distribution. China (Zhejiang).

Notes. Aedeagus is illustrated here for the first time. Aedeagus: slender, dorsal view: strongly asymmetrical, apex with acute tip, apical part narrower than basal part, gradually tapering apically but arching near half of base on right side, nearly straight on left side before apex; lateral view: very slender, nearly straight on left side, suddenly tapering to acute tip at basal 1/4 on right side (Figs 38–39).

11. *Pyrrhalta warchalowskii* Bezděk, 2007

http://species-id.net/wiki/Pyrrhalta_warchalowskii

Figs 19–20, 40–41

Pyrrhalta warchalowskii Bezděk, 2007: 607.

Specimens examined. Type material: Paratype: 1 ♀, original label: “S-INDIA, Tamil Nadu state, Nilgiri hills, 10km SW of Manjoor, 76°35'E, 11°12'N, Thiashola reserved forest / near Carrington estate, ca 2100m, 14-19-VI-1999, Z. Kejval & M. Trýzna leg. / PARATYPUS” (JBCB).

Distribution. India.

12. *Pyrrhalta xizangana* Chen et Jiang, 1981

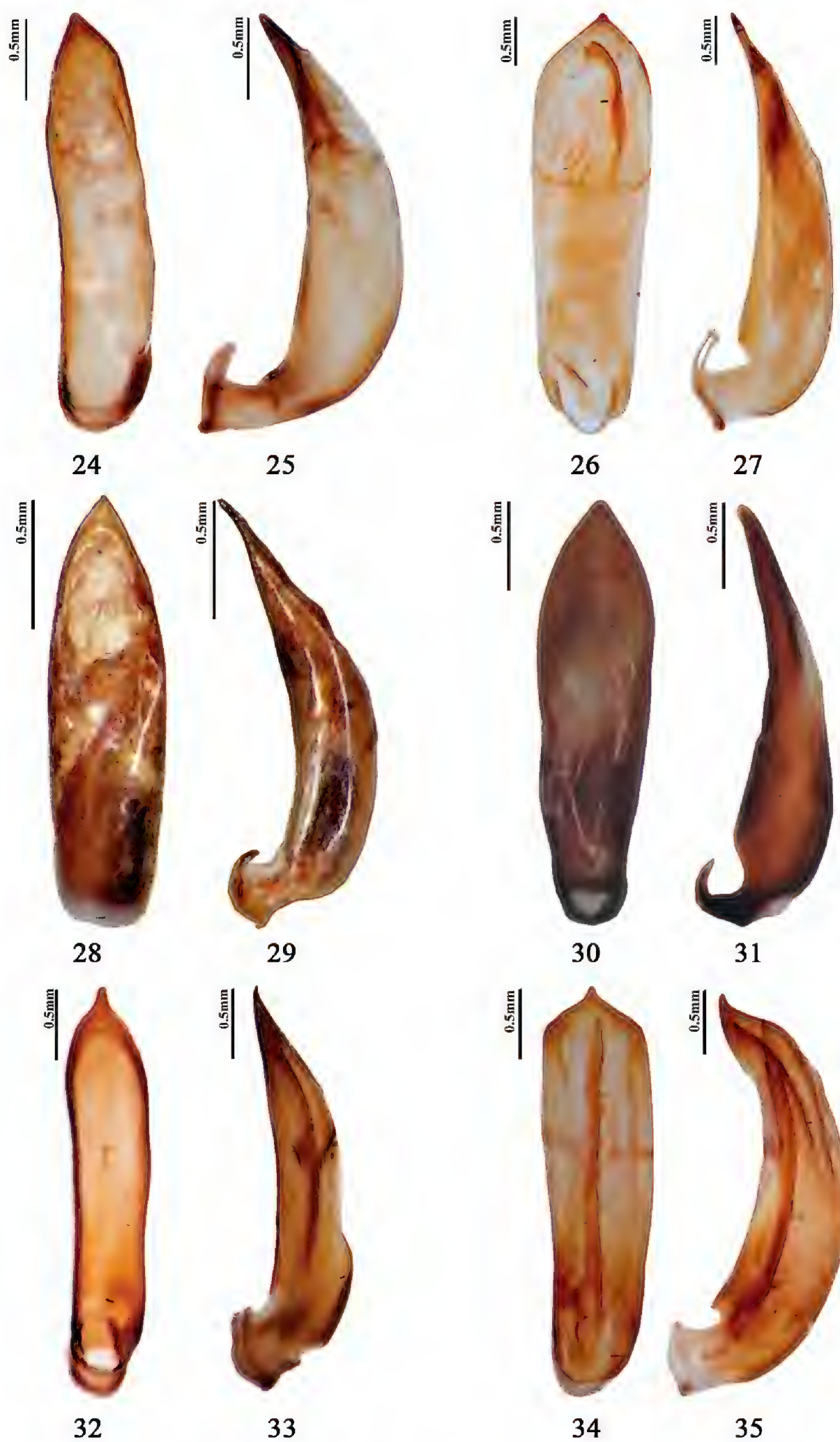
http://species-id.net/wiki/Pyrrhalta_xizangana

Figs 21–22, 43

Pyrrhalta xizangana Chen & Jiang, 1981: 459.

Specimens examined. Type material: Holotype: ♂, re-written (original labels are in Chinese): China, Tibet, 52 Daoban, 9-VII-1976, Yin-Heng Han leg. (IZAS). Paratypes: 3 ♀, re-written (original labels are in Chinese): China, Tibet, Chaya, Jitang, 7-VII-1976, Yin-Heng Han leg. (IZAS).

Distribution. China (Tibet).



Figures 24–35. Aedeagus. **24–25** *P. huangshana* (holotype, **24** dorsal view **25** lateral view) **26–27** *P. martensi* (**26** dorsal view **27** lateral view) **28–29** *P. meghalayana* (paratype, **28** dorsal view **29** lateral view) **30–31** *P. metallica* (**30** dorsal view **31** lateral view) **32–33** *P. orientalis* (**32** dorsal view **33** lateral view) **34–35** *P. subaenea* (syntype, **34** dorsal view **35** lateral view).

13. *Pyrrhalta qianana* Nie & Yang, sp. n.

urn:lsid:zoobank.org:act:0ABCCB95-FF41-4DE8-9185-E2B29454998C

http://species-id.net/wiki/Pyrrhalta_qianana

Figs 44–49

Type material. Holotype: ♂, China, Guizhou, Zunyi, Kuankuoshui Nature Reserve, Baishaogou, 9-VI-2010, Wan-Gang Liu leg. (IZAS). Paratype: 1♂, the same data as holotype (IZAS); 1♂, China, Sichuan, Fengdu, Shiping, 610m, 3-VI-1994, Wen-Zhu Li leg. (IZAS); 1♂, China, Chongqing, Beipei, Tuanjie, 6-V-1999, Hai-Jian Wang and Yin-Fei Zhu leg. (IZAS); 1♀, China, Guizhou, Jiangkou, Huixiangping, 2-III-2001, Guo-Dong Ren leg. (MHBUS); 1♀, China, Sichuan, Emei Mountain, 1800-1900m, 14-VIII-1957, Fu-Xing Zhu leg (IZAS).

Diagnosis. This species can be separated from all known species in the genus by the following characters: very long antennae (length=4.9 mm), antennomere 3 more than 2 times as long as antennomere 2, and last abdominal sternite of male with very deep U-shape cavity (Fig. 46).

Description. Generally black, apex of labrum and mandible, maxilla, dark brown; head, pronotum, elytral margin, elytral suture, yellowish; antenna black except ventral side of antennomeres 1-5; legs brown except ventral sides of tibiae and tarsi black; scutellum yellowish brown, dark brown on basal part. Body densely covered with short pale silvery pubescences.

Head slightly narrower than prothorax; occiput flat; epicranial suture distinct; frontal tubercles distinctly raised, subquadrate, vertex impunctate.

Antennae long, slender, 0.85× as long as body, length ratio of antennomeres 1 to 11: 15-11-24-23-22-20-20-16-19-17-20.

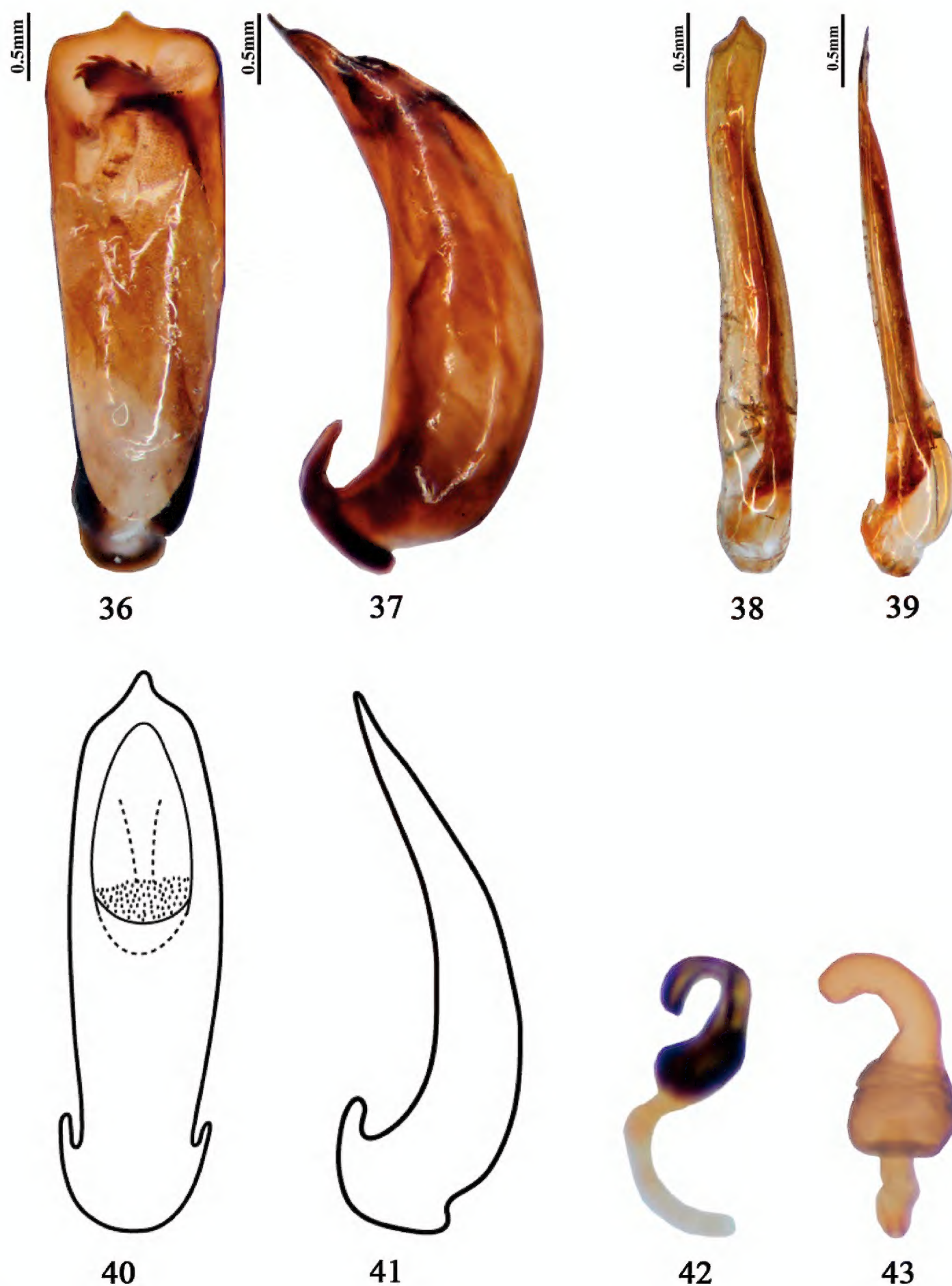
Pronotum transverse, nearly 2× as broad as long, maximum width across pronotum 1.55 mm, distance from basal margin to anterior margin 0.75 mm, anterior margin nearly straight and slightly emarginate at middle, lateral margin constricted in anterior third, basal margin slightly concave mesally; anterior angle nearly rectangular, and posterior angles obtusely rounded. Surface densely pubescent, irregularly punctured, with pair of deep depressions laterally and longitudinal depression in middle.

Scutellum trapezoid, densely punctured, sparsely pubescent.

Elytron subparallel, nearly 3.7× as long as broad, maximum width across both elytra 1.15 mm, linear distance from base to apex of elytra 4.25 mm; surface confusedly punctured and closely covered with fine hairs; space between punctures smaller than diameter of puncture; epipleuron slightly broad basally, gradually narrowed toward apex.

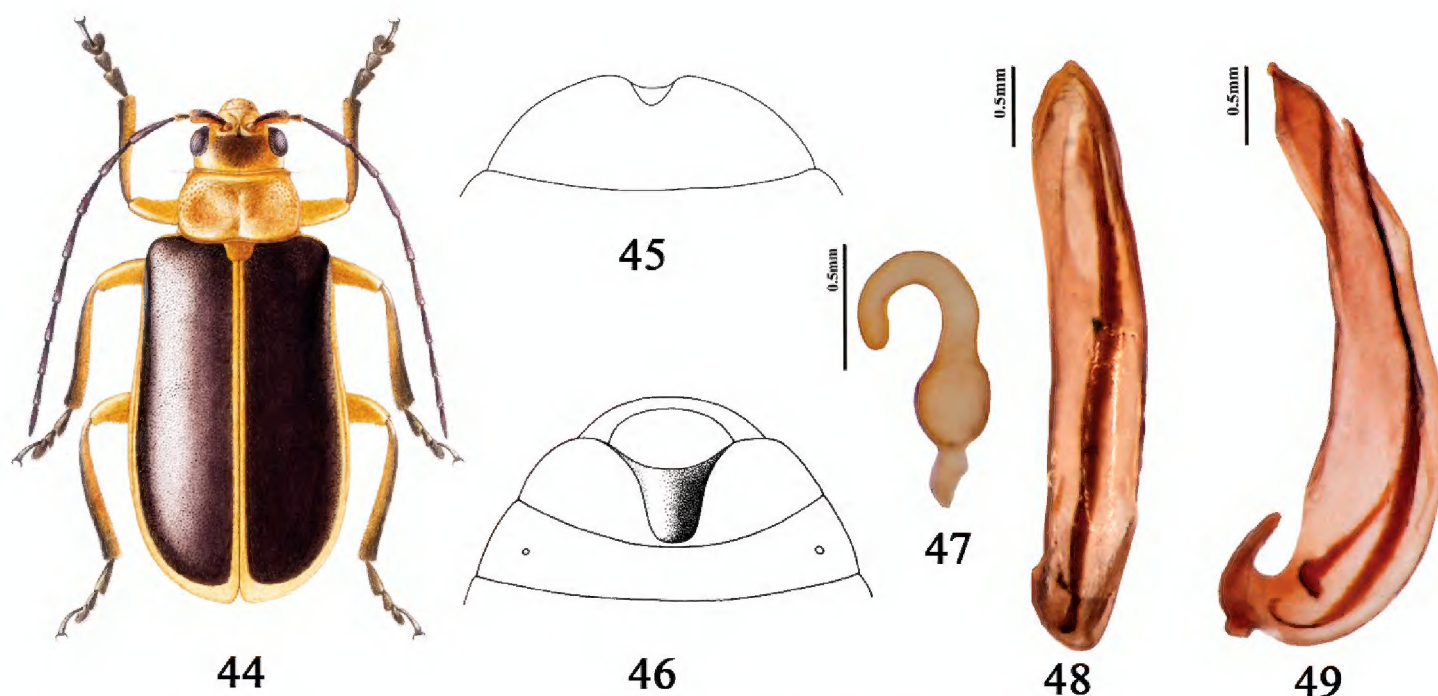
Ventral surface: mesoventrite glabrous, mesepisternum and mesepimeron thinly covered with short pubescence. Middle disc of metaventrite brown, with sparse hairs. Last sternite of male with very deep “U” shape emarginate cavity reaching nearly its basal margin.

Legs moderately stout, hind tarsomere 1 nearly equal with last which is nearly as long as 2 and 3 together.



Figures 36–43. Aedeagus / spermatheca **36–37** *P. sulcatipennis* (holotype, **36** dorsal view **37** lateral view) **38–39** *P. tianmuensis* (**38** dorsal view **39** lateral view) **40–41** *P. warchalowskii* (Bezdek 2007 orig., **40** dorsal view **41** lateral view) **42** spermatheca of *P. fossata* (holotype) **43** spermatheca of *P. xizangana* (paratype).

Male. Last abdominal sternite with very deep U-shape cavity (Fig. 46). Aedeagus: dorsal view: strongly asymmetrical but nearly parallel-sided, apex subacute, tapered; lateral view: somewhat sinuate on left side, gradually tapering to acute tip on right side. (Figs 48–49).



Figures 44–49. *Pyrrhalta quinana* sp. n. **44** Adult **45** The last abdominal sternite of female **46** The last sternite of male **47** spermatheca **48–49** aedeagus (**48** dorsal view **49** lateral view).

Female. Last abdominal sternite with triangle emargination at center of apex (Fig. 45). Spermatheca: base not bent, capsule wall thick, apex of capsule about 1/2 as long as capsule (Fig. 47).

Length: 5.4–5.5 mm (linear distance from labrum to elytral apex); width: 2.0–2.1 mm (width across base of elytra).

Etymology. This species is named for its holotype locality, Guizhou province (shortened form as “Qian” in Chinese).

Distribution. China (Guizhou, Sichuan).

Discussion

Pyrrhalta is a species rich, worldwide distributed genus with complex classification and nomenclature. The relationships of *Pyrrhalta* and related genera (*Galerucella*, *Neogalerucella*, *Xanthogaleruca*, and *Tricholochmaea*) are still unclear. The updated catalogue of Galerucinae treated *Galerucella*, *Xanthogaleruca*, and *Tricholochmaea* were as valid genera and *Neogalerucella* as subgenus of *Galerucella* (Beenen 2010). To explore true relationship of these groups, a thorough revision of *Pyrrhalta* is necessary. Considering that subgenera currently are very poorly defined, we will separate the genus into several artificial groups and produce a series of revisionary works. In this study, we have reviewed *Pyrrhalta* species with black elytra. Based on the current morphological work with thirteen species of *Pyrrhalta* with black elytra two types of internal sac were found. One is with comb-shaped sclerites and another one lacking the sclerites. Comb-shaped sclerites presents in *P. sulcatipennis* and *P. subaenea*. They are absent in the rest of the studied species including *P. orientalis* which is placed in *Xanthogaleruca* in the updated catalogue of Galerucinae (Beenen 2010). Therefore, comb-shaped internal

sac cannot be used to distinguish *Xanthogaleruca* and *Pyrrhalta*. The proper status of *Xanthogaleruca* could not resolve until a thorough revision of *Pyrrhalta* is done. We still need to find reliable characters to identify above related groups. It may be necessary to combine traditional morphological methods with molecular and biological methods to achieve this goal.

Acknowledgments

We thank Mr Wen-Zhu Li for drawing the figures. We are grateful to Dr Jan Bezděk, Dr Si-Qin Ge, Dr Ming Bai and anonymous reviewers for valuable comments. We are most grateful to all of the curators whose material has been used for the present study, particularly to Dr Maxwell VL Barclay (BMNH), Dr Jan Bezděk (Brno, Czech Republic), Dr Michel Brancucci & Dr Eva Sprecher-Uebersax (NHMB), Dr Boris A. Korotyaev (ZIN), Dr Guo-Gong Ren & Dr Yu-Xia Yang (MHBUS). This research was supported by a Key Innovation-Project of CAS (No. KSCX2-YW-Z-0911), and the National Natural Science Foundation of China (No. 3010300101, 30970393, J1210002).

References

- Beenen R (2003) New records of *Xanthogaleruca subcoerulescens* (Weise) in southern Turkey (Coleoptera, Chrysomelidae, Galerucinae). *Entomologische Blätter* 99: 99–103.
- Beenen R (2008) Taxonomical and nomenclatural changes in Palearctic Galerucinae and description of a new species (Chrysomelidae). *Entomologische Blätter* 103/104: 63–80.
- Beenen R (2010) Galerucinae. In: Löbl I & Smetana A (Ed.) *Catalogue of the Palearctic Coleoptera* 6: 74–75, 443–491. Apollo Books, Stenstrup.
- Bezděk J (2007) Notes on the Galerucini from India and Sri Lanka, with description of *Pyrrhalta warchalowskii* n. sp. from Tamil Nadu state, India (Coleoptera: Chrysomelidae: Galerucinae). *Genus* 18: 603–612.
- Chen SH (1942) Galerucinae nouveaux de la Faune Chinoise. *Notes d'Entomologie Chinoise* 9: 1–67.
- Chen SH (1964) New genera and species of Galerucinae from China. *Acta Entomologica Sinica* 13: 201–211.
- Chen SH, Jiang SQ (1981) Coleoptera: Chrysomelidae, Galerucinae. In: Huang FS (Ed.), *Insect of Xizang*, Vol. 1. Science Press, Beijing, 495–460.
- Gök A, Aslan EG, Aslan B (2007) *Xanthogaleruca subcoerulescens* (Weise, 1884) (Coleoptera: Chrysomelidae), a little-known galerucine from Turkey, with a description of the female, additions to the description of the male, and ecological remarks. *Entomological News* 118: 259–262. doi: 10.3157/0013-872X(2007)118[259:XSWCCA]2.0.CO;2
- Gressitt JL, Kimoto S (1963) The Chrysomelidae (Coleoptera) of China and Korea. Part II. *Pacific Insects Monograph*, 1B,, 301–1026 pp.

- Kimoto S (2001) The Chrysomelidae (Insecta: Coleoptera) collected by the Kyushu University Scientific Expedition to the Nepal Himalaya in 1971 and 1972. Bulletin of the Kitakyushu Museum of Natural History 20: 17–80.
- Medvedev LN (2002) New and poorly known Chrysomelidae (Coleoptera) from northern India. Entomologica Basiliensia 24: 245–253.
- Medvedev LN, Sprecher-Uebersax E (1999) Katalog der Chrysomelidae von Nepal. Entomologica Basiliensia 21: 261–353.
- Nie RE, Xue HJ, Hua Y, Yang XK, Vogler AP (2012) Distinct species or colour polymorphism? Life history, morphology and sequence data separate two *Pyrrhalta* elm beetles (Coleoptera: Chrysomelidae). Systematics and Biodiversity 10: 133–146. doi: 10.1080/14772000.2012.687783
- Ogloblin DA (1936) Insectes Coleopteres Vol. 26. Chrysomelidae, Galerucinae. In: Sernov SA, Stackelberg AA (Eds) Faune de L'URSS. l'Academie des Sciences de l'URSS, Moscou, 1–455 pp.
- Silfverberg H (1974) The west Palaearctic species of *Galerucella* Crotch and related genera (Coleoptera, Chrysomelidae). Notulae Entomologicae 54: 1–11.
- Weise J (1924) Chrysomelidae: Galerucinae, In Schenkling S (Ed.) Coleopterorum Catalogus, Pars 78. Berlin: Dr. W. Junk, 182 pp.
- Wilcox JA (1965) A synopsis of the North American Galerucinae (Coleoptera: Chrysomelidae), Bulletin of the New York State Museum and Science Service 400: 1–68 pp.
- Xue HJ, Yang XK (2010) Species catalogue of *Pyrrhalta* Joannis (Coleoptera: Chrysomelidae: Galerucinae) of the World. Entomotaxonomia 32 (Suppl.): 119–136.